

61 HOURS OF CONSTRUCTION RECORDED ON 10 MINUTES OF FILM

One of the most unusual jobs that we have done was to set up time lapse cameras to record 61 continuous hours of construction.

California Structures, Canoga Park, Calif., was awarded a contract to add 9 floors on top of the existing 1 story office of Valley Federal Savings Bank, Van Nuys, Calif. In order to add additional stories, support columns would have to be placed in the ground floor. The existing office floor would have to be torn up, 12 holes, 44 ft. deep, 3 ft. in diameter with 12 foot bells would have to be dug; and each hole reinforced with steel. But this wasn't enough. At no time could the bank be closed during regular business hours. Thus it was decided to do it over a weekend. At 6:00 P.M. Friday, the furniture and fixtures were moved out. At 6:22 P.M. the construction people moved in with special saws, jackhammers and a specially modified drilling rig.

Previously, California Structures had contacted us with the desire to record on film the entire weekend operation. The reason they wanted this record was to have documentary evidence of their efficiency in scheduling, as the entire job was scheduled minute by minute, all in advance.

At the end of the room we set up our time lapse cameras. A Mitchell 16mm with a 5.7 Tegea Lens f/1.8 and 1200 foot magazine. In addition a 35mm still camera was used. Both cameras were coupled to a special Gordon Enterprises designed intervalometer. The Mitchell shot one picture every 10 seconds and the 35mm one picture every 30 minutes. The cameras were not touched during the entire weekend, and only existing light sources were used.

The job was completed 2½ hours ahead of schedule early Monday morning. The cameras had run continuously since Friday evening, and were finally stopped at 8:30 A.M. Monday. The entire 61 hours of construction were condensed into only 10 minutes screening time.

Bob Kuhagen ...

Continued from page 2

Active outside interests include enthusiastic participation in the sport of bowling. Bob is a member of the Society of Photographic Instrumentation Engineers, and has been a member of other prominent photographic societies, both in Chicago, Washington D.C., and Los Angeles.



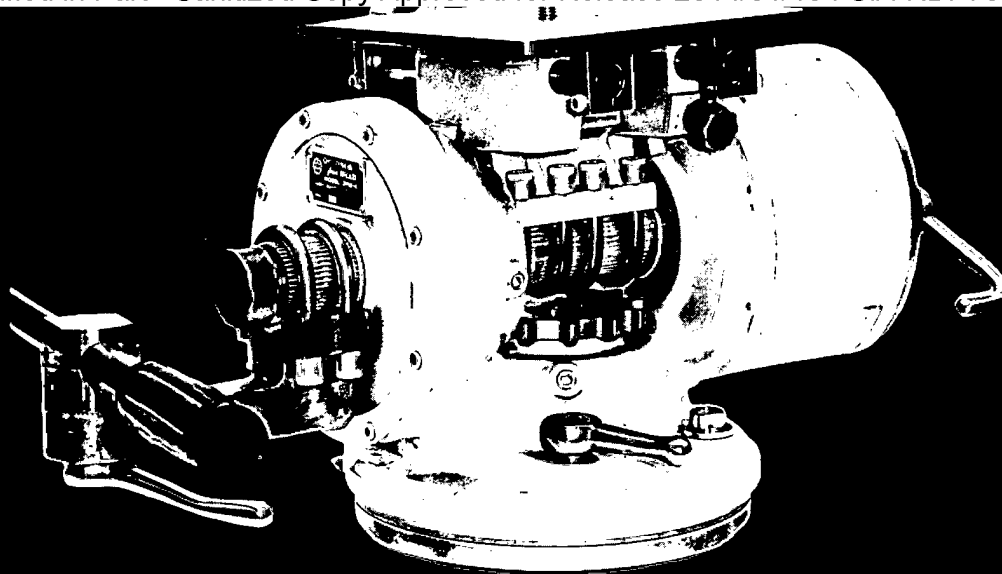
GORDON TO DISTRIBUTE GRAPH-CHECK SEQUENCE CAMERA



We are very happy to announce that we are now distributing the Graph-Check Sequence Camera in the 11

Western States. The Graph-Check is designed to make possible photographic analysis of high speed motion, 10 seconds after the photograph has been taken. It is built around a Poloroid Land Film Holder, and has 8 separate lenses, each with its own shutter. Each shutter clicks in automatic pre-set sequence at 1/1000 of a second, and all 8 pictures may be taken in as little as 1/10 of a second or extended to a maximum of 10 seconds. The finished photo is an 8 frame, 4x5 picture, ready to view in 10 seconds. The camera is very simple to use, having only 2 controls, one for exposure, and one for regulation of sequence duration. Standard Poloroid Land 4x5 film is used, which is available in single packet form. The camera is small enough to be carried around easily, weighing only 5 lbs., and measuring 5½" high x 2¾" wide, x 11" long.

Continued on page 4



O'CONNOR FLUID CAMERA HEAD Type 200-A

The O'Connor Fluid Camera Head, Model 200-A, was designed to provide perfectly controlled pan and tilt action for the most difficult photographic applications. The unit is especially compatible for use with heavy television and motion picture cameras weighing up to 200 pounds. Tracking of objects moving at high speeds, such as missiles, is accomplished with smooth, continuous action and perfect control.

The adjustable drag may be independently set for both pan and tilt action. In addition, a full mechanical lock "freezes" the pan or tilt action as required for the particular type of shooting being done. Finger-tip locking action is also provided for both functions. Counterbalanced design of the "tilt" function of the head compensated for the weight of the camera. Smooth operation is further assured through the use of pre-loaded ball and roller bearings which are incorporated into all moving parts. The entire assembly is mounted on Timken bearings for full freedom of action. Full fluid action operates from below zero temperatures up through 120 degrees F. Additional operational features include a

built-in override to insure quick returns on both the pan and tilt actions, and full weatherproofing against water, dust and sand by use of Buta-N "O"-ring seals. The operating handles are interchangeable, left and right, for full operator convenience, and all the finest high-strength aluminum alloy and steel parts assure trouble-free service. The manufacturer offers a full 5 year guarantee, backed up by Gordon Enterprises.

SPECIFICATIONS:

Dimensions:	8" high x 12" wide.
Weight:	32 pounds.
Tilt:	Head tilts to within 15 degrees of the vertical in both directions. (Minus 75 degrees to plus 75 degrees).
Level:	Built-in precision bulls-eye with a guaranteed accuracy of 30 min. of arc.
Camera Mounting:	Pop-up camera tie-down screw with bevel gear drive for ease of tightening.

The O'Connor 200-A Head is furnished with Mitchell Standard or O'Connor "level head" bases. An extra handle is supplied for "handle-bar" operation.

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TELEPHONE 766-3725

Gordon Enterprises is pleased to announce its association with Gamma Scientific, Incorporated, as sales representative for the A-500 Luminance Analyzers.

We feel that these spot photometers are new and practical tools for the critical control of light in photography, and television.

For you, their accuracy and versatility can mean improved product quality at a lower production cost.

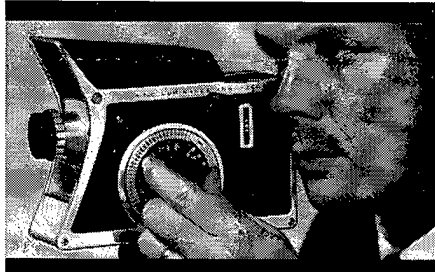
On difficult assignments they can give you the extra information that makes the difference.

We would appreciate an opportunity to demonstrate the A-500's to you and discuss their application to your problems.

WATCH FOR THESE ADVERTISEMENTS IN LEADING TECHNICAL TRADE JOURNALS

ANNOUNCING!

New Tool To Solve Critical Lighting/Exposure Problems

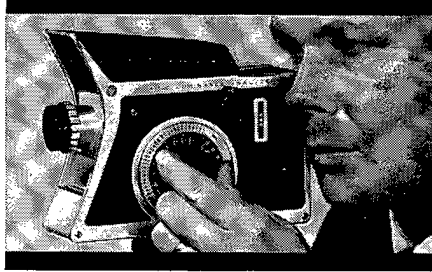


For difficult assignments with no second chance, the A-500 Luminance Analyzer arms the professional photographer with accurate, complete pre-exposure information in 30 seconds. It measures over-all scene brightness range and the relationship of any scene element to this range. Also, it simultaneously computes exposure on the exact constant density principle. This high-definition spot photometer features $\frac{1}{2}^\circ$ acceptance angle (1/4000 typical scene) ... accuracy of ± 0.1 log ... adjustable spectral characteristics for film or eye ... exceedingly low flare ... no polarization error. Write for details.

 **GAMMA SCIENTIFIC, INC.**
5841 Mission Gorge Road, San Diego 20, Calif.

ANNOUNCING!

NEW TOOL TO SOLVE TV LIGHTING PROBLEMS

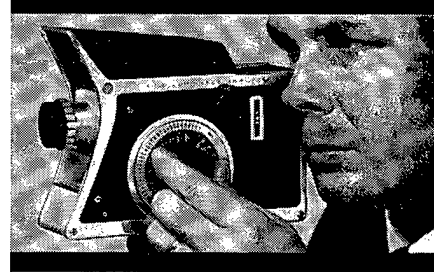


Now used by major TV networks and stations in U.S. and abroad, the A-500 spot brightness meter permits fast analysis of any TV lighting problem. Features $\frac{1}{2}^\circ$ acceptance angle—1/4000 typical scene. Selectable color response—film, TV, eye. Applications include rapid, accurate measurement of scene luminance (brightness) ratios, lighting balance, screen brightness, costume and scenery reflectance, and kinescope brightness and contrast. Two versions: A-500 fL for measuring footlamberts and A-500 EC with integral exposure computer. Write for brochure.

 **GAMMA SCIENTIFIC, INC.**
5841 Mission Gorge Road, San Diego 20, Calif.

ANNOUNCING!

NEW TELEPHOTOMETER FOR LUMINANCE ANALYSIS



With the new A-500 fL Luminance Analyzer, you can measure brightness ratios and footlamberts anywhere with ease and speed never before possible. This photomultiplier telephotometer features $\frac{1}{2}^\circ$ acceptance angle ... photopic spectral response ... direct reading of ratios ... integral computer to convert readings to footlamberts. Measures 0.3-20,000 ft-L without drift adjustment—without warmup. No polarization error. No focusing. Exceedingly low flare. Write for full details.

 **GAMMA SCIENTIFIC, INC.**
5841 Mission Gorge Road, San Diego 20, Calif.



A-500 LUMINANCE ANALYZER

GAMMA SCIENTIFIC INCORPORATED

GENERAL CHARACTERISTICS The A-500 Luminance Analyzer is a high definition spot photometer. Its acceptance angle is $\frac{1}{2}$ degree (a circle 1 inch in diameter at 8 feet).

A photomultiplier tube is used as sensor because of its:

1. Extreme sensitivity.
2. High stability and low fatigue characteristics.
3. Adaptability to color modification.

The A-500 is the only spot photometer designed to measure light ratios rapidly and conveniently. Ratios over 1,000 to 1 can be read without throwing a range switch.

Luminance range is greater than 0.3 to 10,000 foot lamberts. High sensitivity models to below .001 foot lamberts are available.

A small acceptance angle, proper color response, and an excellent optical system allow the A-500 to measure light accurately from small, inaccessible areas (inside surgical incisions) or from objects at a great distance (cloud high-lights).

Color response is matched by internal filters to:

1. The photopic response of the eye;
2. Panchromatic response of film; or
3. The S-10 and S-18 surfaces of TV camera tubes.

It is not a visual type photometer, eliminating human judgment errors.

The A-500 is a practical instrument because it has no zero, balance, or drift adjustments, is completely self-contained, and has been designed throughout to withstand the rigors of field use.

Power is consumed only while taking a reading. There is no warm-up drift. Battery life is in excess of 60 hours. There is a built-in battery check.

Flare is exceedingly low because of:

1. Double light baffles behind lens.
2. Built-in 22.5° sun shade.
3. Careful selection and individual testing of lens.
4. Completely separate view finder from photometer.

Its straight-through optical system, without partial reflecting surfaces, gives the A-500 complete freedom from polarization error, insuring accuracy in measuring reflected glare.

The electronic circuitry, including the photomultiplier tube base, is encapsulated to insure stability under conditions of extreme humidity and to protect it from shock and vibration.

Because of the A-500's logarithmic response, the accuracy of reading the meter scale remains constant regardless of meter deflection, an important characteristic in measuring ratios.

View finder features:

1. Simultaneous viewing of scene and meter.
2. X 1 magnification and excellent eye relief.
3. No image inversion, reversal, or ghosts.
4. No "washing out" of meter scale or reticle.

DESCRIPTION The A-500's objective lens, similar to a camera's, forms an image on an aperture plate corresponding to the film plane in the camera. A very small hole in the plate allows only the light from the center of the image to pass through to the photomultiplier. Because there is so little light available, the photomultiplier's unique ability to amplify the photo current a million times makes it the ideal photo sensor for this measurement.

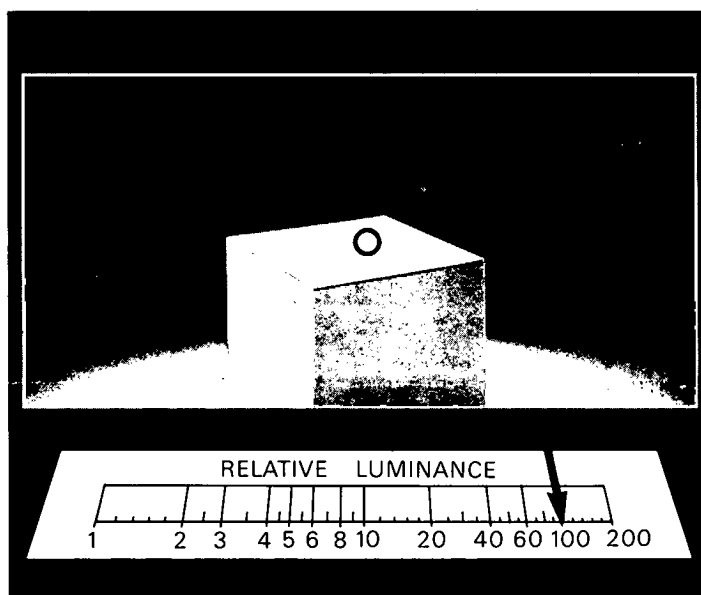


FIG. 1

The illustration above shows what the operator sees in the view finder. In the top portion he sees the object to be measured. A collimated, illuminated ring reticle encloses the area being measured. Immediately below the field of view, the indicating meter is visible so that the operator does not have to move his head between pointing the instrument and reading the meter. This design also allows rapid zeroing-in of the A-500 on the maximum or minimum luminance in an area.

A calibrated, continuously variable sensitivity control on the side of the instrument allows the A-500 to be pointed at a remotely located surface and adjusted so that its meter reads 100 (as shown in the illustration). Then, by aiming the A-500 at other areas, the observer can relate the reading of these areas in terms of per cent to the first or reference area. Thus, luminance or brightness or contrast ratios can be directly determined.

In Figure 2, three views of a cube show the measurement technique of the analyzer. In Figure 2A, the instrument is aimed at the brightest portion of the scene (in this case, the top of the cube). Then the variable sensitivity control is adjusted until the meter reads 100. In Figure 2B, the instrument is aimed at the side of the block and another reading is taken without further adjustment of the sensitivity control. This second reading then is made relative to the first. In the illustration, this side of the cube reads 50.

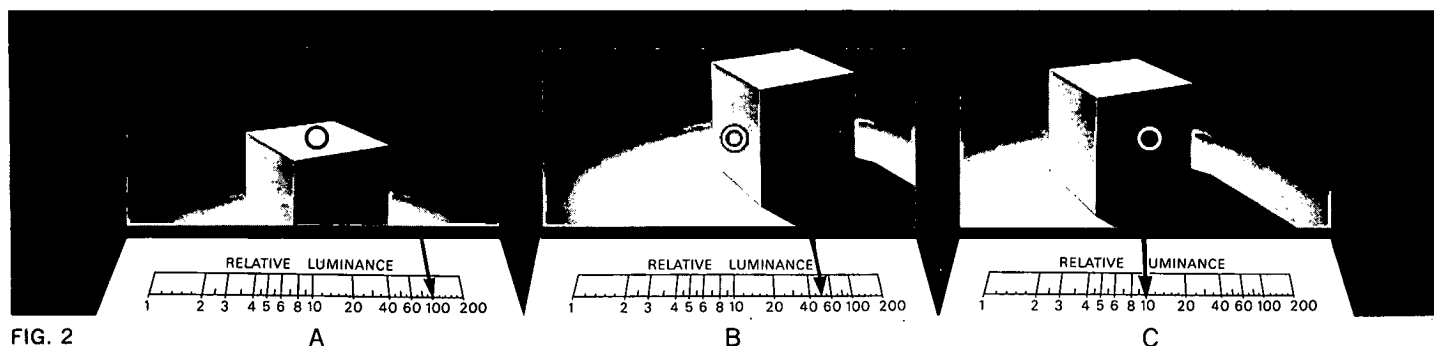


FIG. 2

A

B

C

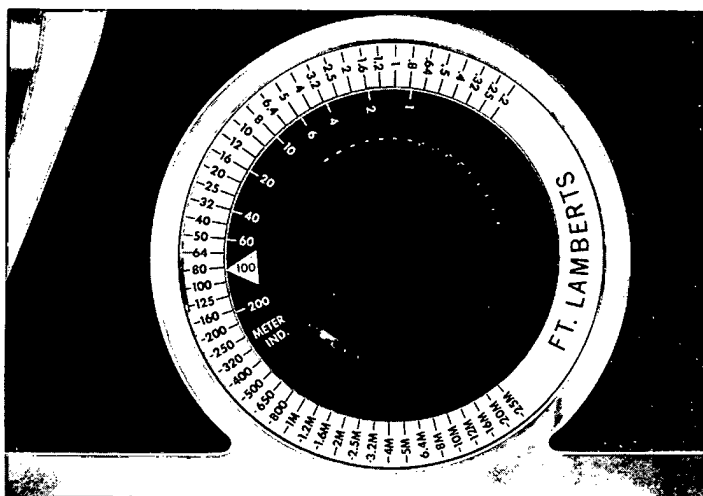


FIG. 3

In Figure 2C, the instrument is aimed at the dark side of the cube, again without adjusting the sensitivity control, and again the measurement is made in relation to the original reference, the top of the cube. This side of the cube has 10% the luminance of the top of the cube.

There are two models of the A-500. These are identical except for the calibration on the sensitivity control. One, the A-500 fL, has a foot lambert computer, allowing any indication of the meter and setting of the sensitivity control to be read directly in foot lamberts. This computer is shown in Figure 3. In the illustration, a meter deflection of 20 (on the "Meter Ind." scale) corresponds to a 16 foot lambert level as read off from the "Ft Lambert Scale."

The second version, the A-500 EC, features an exposure computer shown in Figure 4. This allows the photographer to measure the actual lighting balance, and in particular to see that the flesh tones are properly positioned with regard to the maximum and minimum luminance values in the scene. While the lighting balance is being checked and adjusted, the exposure computer is simultaneously determining the proper exposure on the constant density principle. For instance, exposure can be computed on the basis of the brightest portion of the scene to be photographed merely by pointing the instrument at this part of the scene and adjusting the sensitivity control so that the meter deflection corresponds to a point on the characteristic curve of the film representing the maximum density desired in the negative, or minimum density in reversal film.

This approach to exposure determination is particularly important for both black and white and color reversal films and, also, in any film, either black and white or color, positive or negative, for television.

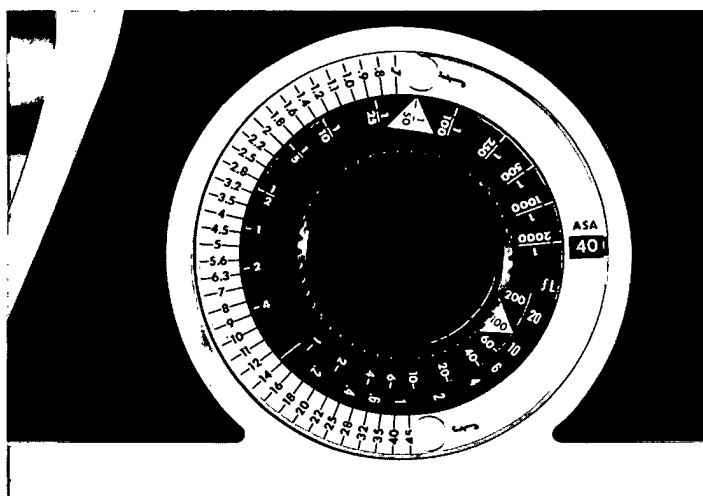


FIG. 4

APPLICATIONS

TELEVISION & FILM SCENE LIGHTING Once a TV camera has been aligned by means of a properly illuminated gray scale and wave form monitor, the A-500 may be used to check the absolute luminance of each of the strips of the gray scale. These levels can then be transferred by means of the A-500 to a set to be televised by adjusting the lighting. This procedure insures that a properly lit scene is fed the TV camera both in regard to absolute light level and brightness range. Once the range has been so determined the A-500 may be used to light scenes without a live camera.

It should be emphasized that through this approach the best gray scale rendition can be established and maintained for any television system, particularly important with $4\frac{1}{2}$ " image orthicon cameras.

The above remarks also hold for the making of motion pictures for television. In this case, the gray scale should be photographed first and used in the developing and printing of the film as the basic contrast control means. Then when the film is projected into the television system, the gain and pedestal controls of the TV chain can be adjusted for best gray scale rendition and with the assurance that the film to follow will match this gray scale range and, as a result, be optimally transmitted.

ILLUMINATION ENGINEERING AND HUMAN FACTORS ANALYSIS Because the A-500, with its adjustable sensitivity control, is designed to measure luminance ratios directly and accurately, and because of its $\frac{1}{2}$ degree acceptance angle, an important application of the instrument is in the area of visual task evaluation and brightness and seeing criteria.

Also, and in particular, the A-500's low flare and complete freedom from any polarization characteristics suits it to reflected glare measurement.

Additionally, its self-contained, compact form, the fully encapsulated electronics, makes it a practical, rugged instrument in the field.

REFLECTANCE MEASUREMENTS The A-500 is a particularly convenient instrument to use in measuring reflectance of surfaces.

With an 18% card in the same illumination as the unknown surface, the operator merely points the A-500 at the card and adjusts the sensitivity control so that the meter deflection is 18. Then, by swinging the instrument over to the unknown surface, he can read off its reflectance directly from the meter scale in terms of per cent.

SCREEN BRIGHTNESS Screen brightness measurements can be taken with the A-500 from various audience locations in the theater, drive-in, or screening room to study how the screen brightness varies with seating location.

KINESCOPE RECORDING The A-500 can be used to control kinescope light output and luminance range in the making of film recordings. Not only can it readily monitor a small reference area and measure slight variations in light output, but the recording engineer, when using it, can also check the range and linearity of the kinescope's gray scale when a stair step test pattern is displayed.

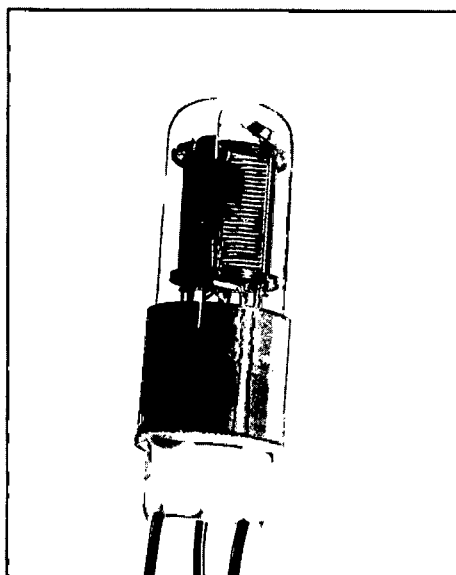
Through the use of standard portrait lenses, the A-500 can analyze an area as small as 0.15" in diameter at a distance of 17" from the tube face.



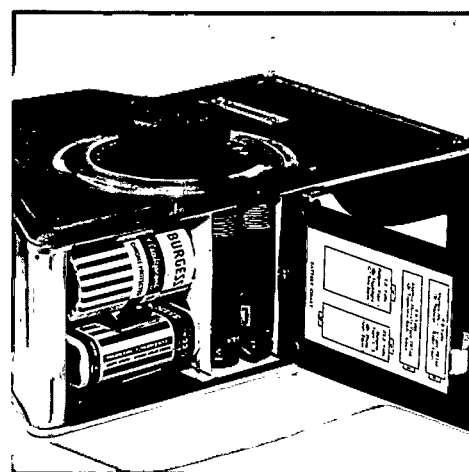
External filters and portrait lenses may be added to the A-500 behind the sun shade. The filter holder is designed to accept standard Series 5 size filters and lenses.

As a result, when the photographer wishes to use a filter on his camera, he can add one of the same type to the A-500 and measure luminance ratios on the same basis as the response of the filter-film combination of the camera. Then the exposure computer in the A-500 will compute exposure directly, taking into account the filter's attenuation. Filter factors are not used in computing exposure in this case.

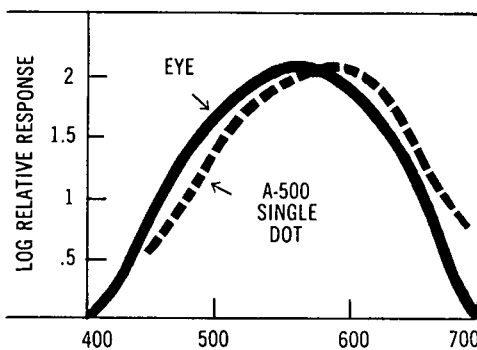
Series 5 portrait lenses may also be added for closeup work. Adding a 2 diopter lens will focus the A-500 on an area 0.15" in diameter at a distance of 17 inches.



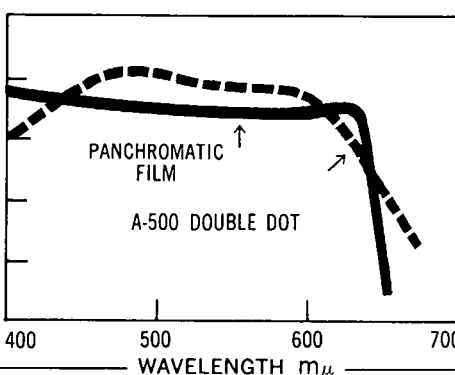
The dividing resistors of the photomultiplier assembly are soldered directly to the tube's pins and the whole base assembly filled with silicone rubber, protecting this critical part of the circuit from dust and humidity. The electronic circuit is similarly potted.



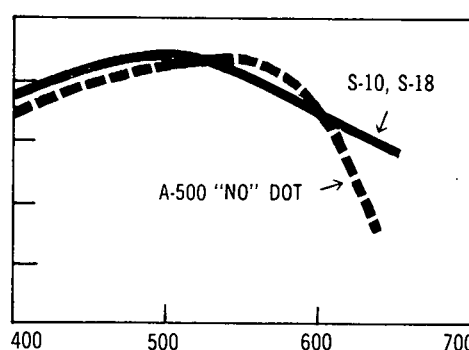
The A-500's power is supplied by self-contained batteries. The instrument uses two standard 9 volt transistor batteries, one 1½ volt C sized dry cell, and one miniature 22½ volt photo flash battery. All are readily available, popular batteries that the operator can change quickly and easily. The instrument contains a battery checking feature that allows the condition of the batteries to be quickly ascertained. Battery life is greater than 60 hours. Power is consumed only when the trigger is pulled. There is no warm-up drift.



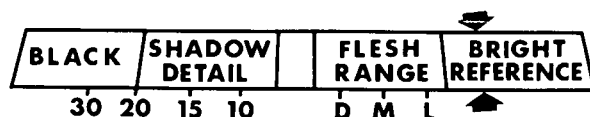
By means of the filter wheel on the upper left side of the instrument, the spectral response of the A-500 can be readily changed. In the graph above, with the filter wheel in the single dot position, the A-500 matches the photopic response of the eye.



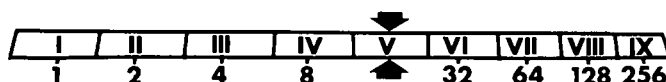
With the wheel in the double dot position the response is broadened to match the spectral curve of color and panchromatic black and white film. This match is superior to any other photographic light measuring device. For instance, the match is so close that using different film speed ratings for daylight and tungsten is improper. The daylight rating is always used.



In the "no" dot position, the response closely matches the S-10 and S-18 surfaces of image orthicon and vidicon TV camera tubes, as shown above.



Here are two special meter scales. One is specifically designed for the limited luminance range of television. For a given bright or white reference level it shows the normal proper flesh tone range, with markings for light (L), medium (M), and dark (D) complexions. Also clearly defined are the shadow detail area and the black limit below which detail will not be satisfactorily reproduced. This scale is particularly well-suited for TV production use and for instructing personnel in proper lighting for TV.



This other scale is based on the Zone approach to photography. The A-500 is ideal for application of this theory because its variable sensitivity control allows any scene element to be placed in any zone and the exposure computed directly on this basis.

TECHNICAL SPECIFICATIONS

LOOK ANGLE: One-half degree
LUMINANCE RANGE: In excess of 10,000 foot lamberts to less than .3 foot lamberts in two ranges. Higher sensitivity models, to below .001 foot lamberts, are available.
METER RANGE: 200 : 1
ACCURACY: ±0.1 log
VARIABLE SENSITIVITY CONTROL RANGE: In excess of 100 to 1
OVERLAP BETWEEN RANGES: At least 10 to 1

WEIGHT: 3 pounds with batteries
DIMENSIONS: 7½" long, 2½" high, 6" wide
MOUNT: Standard ¼-20 tripod socket
FILTER WHEEL: 4 positions: first position, photopic; second, film; third, matching S-10 and S-18 response; fourth, available for special filters on order.
EXPOSURE COMPUTER ON A-500 EC MODEL: f 0.7 to f 45
 1/2000 to 4 sec.
 .1 to 12,000 ASA



GAMMA SCIENTIFIC, INCORPORATED
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